



Search Report

EIC 2800

STIC Database Tracking Number: 235192

To: SCOTT RICHEY
Location: JEF-6A18
Art Unit: 2877
Friday, August 24, 2007

Case Serial Number: 10/532453

From: PAUL KIM
Location: EIC2800
JEF-4B68 / JEF-4B59
Phone: (571)272-8949

paul.kim3@uspto.gov

Search Notes

Attached are the search histories and edited search results from Dialog and STN.

Based on this, if you have questions or would like a refocused search, please contact me.

Respectfully,
Paul Kim
Technical Searcher



STIC Search Results Feedback Form

EIC 2800

Questions about the scope or the results of the search? **Contact the EIC searcher or contact:**

Jeff Harrison, EIC 2800 Team Leader
571-272-2511, JEF 4B68

Voluntary Results Feedback Form

➤ I am an examiner in Workgroup: :: Example: 2810

➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC-EIC2800, JEF-4B68



*** It is now 8/24/2007 2:32:30 PM ***

[File 2] **INSPEC 1898-2007/Aug W2**

(c) 2007 Institution of Electrical Engineers. All rights reserved.

Set	Items	Description
S1	27995	S CC=(A4110D OR B5100)
S2	6599	S S1 AND CURRENT?. ?
S3	2937	S S2 AND (OPTICAL?? OR ELECTROMAGNETIC???? OR LIGHT???)
S4	0	S S3 AND SURFACE () DISPLACEMENT? ?
S5	30	S S3 AND VIBRATION? ?

[File 2] **INSPEC 1898-2007/Aug W2**

(c) 2007 Institution of Electrical Engineers. All rights reserved.

[File 6] **NTIS 1964-2007/Aug W3**

(c) 2007 NTIS, Intl Cpyrghrt All Rights Res. All rights reserved.

[File 8] **Ei Compendex(R) 1884-2007/Aug W2**

(c) 2007 Elsevier Eng. Info. Inc. All rights reserved.

[File 34] **SciSearch(R) Cited Ref Sci 1990-2007/Aug W4**

(c) 2007 The Thomson Corp. All rights reserved.

[File 35] **Dissertation Abs Online 1861-2007/Jul**

(c) 2007 ProQuest Info&Learning. All rights reserved.

[File 56] **Computer and Information Systems Abstracts 1966-2007/Aug**

(c) 2007 CSA. All rights reserved.

[File 57] **Electronics & Communications Abstracts 1966-2007/Jul**

(c) 2007 CSA. All rights reserved.

[File 60] **ANTE: Abstracts in New Tech & Engineer 1966-2007/Jul**

(c) 2007 CSA. All rights reserved.

[File 65] **Inside Conferences 1993-2007/Aug 23**

(c) 2007 BLDSC all rts. reserv. All rights reserved.

[File 68] **Solid State & Superconductivity Abstracts 1966-2007/Jul**

(c) 2007 CSA. All rights reserved.

[File 95] **TEME-Technology & Management 1989-2007/Aug W3**

(c) 2007 FIZ TECHNIK. All rights reserved.

[File 99] **Wilson Appl. Sci & Tech Abs 1983-2007/Jul**

(c) 2007 The HW Wilson Co. All rights reserved.

[File 103] **Energy SciTec 1974-2007/Jul B2**

(c) 2007 Contains copyrighted material. All rights reserved.

**File 103: For access restrictions see Help Restrict.*

[File 104] **AeroBase 1999-2007/Jul**

(c) 2007 Contains copyrighted material. All rights reserved.

[File 144] **Pascal 1973-2007/Aug W1**

(c) 2007 INIST/CNRS. All rights reserved.

[File 239] **Mathsci 1940-2007/Oct**

(c) 2007 American Mathematical Society. All rights reserved.

[File 434] SciSearch(R) Cited Ref Sci 1974-1989/Dec
(c) 2006 The Thomson Corp. All rights reserved.

[File 23] CSA Technology Research Database 1963-2007/Jul
(c) 2007 CSA. All rights reserved.

Set	Items	Description
S1	30271	S (IR OR VOLTAGE) () DROP? ?
S2	220556	S ELECTRIC () POTENTIAL? ?
S3	246479	S S1:S2
S4	9833	S SURFACE () DISPLACEMENT? ?
S5	1788	S S4 AND (LIGHT OR OPTICAL OR ELECTROMAGNETIC????)
S6	116	S S5 AND CURRENT? ?
S7	72	RD (unique items)
S8	57	S S7 NOT PY>2002

Set	Items	Description
S1	30271	S (IR OR VOLTAGE) () DROP? ?
S2	220556	S ELECTRIC () POTENTIAL? ?
S3	246479	S S1:S2
S4	31792	S S3 AND (LIGHT OR OPTICAL OR ELECTROMAGNETIC????)
S5	31792	S S4
S6	12659	S S4 AND CURRENT? ?
S7	131	S S6 AND VIBRAT????
S8	87	RD (unique items)
S9	49	S S8 NOT PY>2002
S10	9833	S SURFACE () DISPLACEMENT? ?
S11	1788	S S10 AND (LIGHT OR OPTICAL OR ELECTROMAGNETIC????)
S12	116	S S11 AND CURRENT? ?
S13	49	S S9 NOT S12
S14	10029	S S6 AND VOLT????
S15	3496	S S1 AND (LIGHT OR OPTICAL OR ELECTROMAGNETIC???? OR PHOTO?)
S16	1954	S S15 AND CURRENT? ?
S17	2554	S S1 AND (LIGHT OR OPTICAL OR PHOTO?)
S18	1457	S S17 AND CURRENT? ?
S19	155944	S (MEASUR????? OR DETECT?????) (3N) (POSITION? ? OR DISPLACE?????)
S20	4	S S18 AND S19

Set	Items	Description
S1	706141	S VOLT???? AND CURRENT? ?
S2	107226	S S1 AND (LIGHT OR OPTICAL?? OR PHOTO?)
S3	8	S S2 AND SURFACE () DISPLACEMENT? ?
S4	5	RD (unique items)
S5	491	S S2 AND NONDESTRUCTIVE
S6	190976	S NONDESTRUCTIVE () TEST????
S7	230	S S2 AND S6
S8	193	RD (unique items)
S9	9	S S8 AND VOLTAGE () DROP? ?
S10	1434	S S2 AND VOLTAGE () DROP? ?
S11	16	S S10 AND VIBRATION? ?
S12	10	RD (unique items)

Set	Items	Description
-----	-------	-------------

S1 706141 S VOLT???? AND CURRENT? ?
S2 53288 S CURRENT? ? (3N) (MATERIAL? ? OR OBJECT? ? OR
SUBSTANCE? ?)
S3 9642 S S1 AND S2
S4 1812 S S3 AND (LIGHT OR OPTICAL?? OR PHOTO?)
S5 28 S S4 AND (VIBRATION? ? OR NONDESTRUCTIVE? ? OR
DISPLAC?????)
S6 21 RD (unique items)

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	10821	voltage adj drop with current	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/08/24 16:32
L2	922	1 and (light optical\$3 photo\$8)	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/08/24 16:32
L3	45	2 and (displac\$5 vibration position)	EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/08/24 16:33

(FILE 'HOME' ENTERED AT 16:57:58 ON 24 AUG 2007)

FILE 'HCAPLUS' ENTERED AT 16:58:51 ON 24 AUG 2007

L1 2461 SEA ABB=ON PLU=ON VOLTAGE (W) DROP AND CURRENT

L2 8429 SEA ABB=ON PLU=ON S1 AND (PHOTO? OR LIGHT OR
OPTICAL##)

L3 2 SEA ABB=ON PLU=ON L2 AND SURFACE (W) DISPLACEMENT

L4 2 SEA ABB=ON PLU=ON L2 AND NONDESTRUCTIVE

20/9/2 (Item 1 from file: 95) [Links](#)

Fulltext available through: [USPTO Full Text Retrieval Options](#)

TEME-Technology & Management

00651734 E93036052033

Explanantion of current crowding phenomena induced by impact ionization in advanced Si bipolar transistors by means of electrical measurements and light emission microscopy

(Erklaerung der Stromzusammendraengung, die durch die Stossionisation in fortgeschrittenen Bipolartransistoren induziert wird, mit Hilfe elektrischer Messungen und Lichtemissionsmikroskopie)

Pavan, P; Vendrame, L; Bigliardi, S; Marty, A; Chantre, A; Zanoni, E

Univ. Padua, I; Univ. Parma, I; France Telecom, Meylan, F

ESSDERC '92. Solid state device research 92. Proceedings of the 22nd European conference, Leuven, B, September 14 - 17, 1992 Microelectronic Engineering, v19, n1-4, pp699-702 , 1992

Document type: journal article **Language:** English

Record type: Abstract

ISSN: 0167-9317

Abstract:

This paper analyses impact phenomena in advanced polysilicon emitter bipolar transistors. Two intrinsic limitations affecting multiplication coefficients at high electric fields are discussed. Emission microscopy is adopted to directly investigate and observe **current** crowding effects at the basis of the first kind of instability, which takes place when the device is driven at constant emitter **current** $I_{(sub\ E)}$. The second kind of instability consists in the snap-back of the collector **current** $I_{(sub\ C)}$ when the device is driven at constant emitter-base voltage $V_{(sub\ EB)}$ and can be explained by a simple model which takes into account the **voltage drop** induced by negative base **current** on the base spreading resistance.

Descriptors: BIPOLAR TRANSISTORS; AMPERAGE; EMITTER--TRANSISTORS; ELECTRIC FIELD; ELECTRIC VARIABLES **MEASUREMENT**; MICROSCOPES; **CURRENT DISPLACEMENT**; COLLECTOR--TRANSISTORS; COLLISION IONIZATION; MEASUREMENT PROCEDURE; EXPERIMENTAL RESULTS; SILICON

Identifiers: Stromverdraengung; Mikroskopie; Bipolartransistor

8/9/4 (Item 4 from file: 2) **Links**

Fulltext available through: USPTO Full Text Retrieval Options

INSPEC

08433196 **INSPEC Abstract Number:** A2002-24-0630C-001, B2002-12-7320C-011

Title: Surface displacement imaging by interferometry with a light emitting diode

Author Dilhaire, S.; Grauby, S.; Jorez, S.; Lopez, L.D.P.; Rampnoux, J.-M.; Claeys, W.

Author Affiliation: Centre de Phys. Moleculaire Optique et Hertzienne, Bordeaux I Univ., Talence, France

Journal: Applied Optics vol.41, no.24 p. 4996-5001

Publisher: Opt. Soc. America ,

Publication Date: 20 Aug. 2002 **Country of Publication:** USA

CODEN: APOPAI **ISSN:** 0003-6935

SICI: 0003-6935(20020820)41:24L.4996:SDII;1-S

Material Identity Number: A132-2002-025

U.S. Copyright Clearance Center Code: 0003-6935/02/244996-06\$15.00/0

Language: English **Document Type:** Journal Paper (JP)

Treatment: Applications (A); Experimental (X)

Abstract: We present an imaging technique to measure static **surface displacements** of electronic components. A device is supplied by a transient **current** that creates a variation of temperature, thus a **surface displacement**. To measure the latter, a setup that is based on a Michelson interferometer is used. To avoid the phenomenon of speckle and the drawbacks inherent to it, we use a **light emitting diode** as the **light** source for the interferometer. The detector is a visible CCD camera that analyzes the **optical** signal containing the information of **surface displacement** of the device. Combining images, we extract the amplitude of the **surface displacement**. Out-of-plane **surface-displacement** images of a thermoelectric device are presented. (13 Refs)

Subfile: A B

Descriptors: CCD image sensors; displacement measurement; electronic speckle pattern interferometry; **light** emitting diodes; **light** interferometry; Michelson interferometers; Peltier effect; surface topography measurement; thermoelectric devices; transients

Identifiers: **surface displacement** imaging; interferometry; **light** emitting diode; imaging technique; static **surface displacements** measurement; electronic components; transient **current**; Michelson interferometer; **light** source; visible CCD camera; **optical** signal; out-of-plane **surface- displacement** images; thermoelectric device

Class Codes: A0630C (Spatial variables measurement); A0760L (Optical interferometry); A4280Q (Image detectors, convertors, and intensifiers); B7320C (Spatial variables measurement); B4260D (Light emitting diodes); B7230G (Image sensors)

Copyright 2002, IEE

8/9/12 (Item 12 from file: 2) [Links](#)

Fulltext available through: [USPTO Full Text Retrieval Options](#)

INSPEC

05263901 INSPEC Abstract Number: A9223-6116P-035

Title: High-frequency surface-displacement detection using an STM as a mixer-demodulator

Author Strozewski, K.J.; McBride, S.E.; Wetsel, G.C., Jr.

Author Affiliation: Texas Univ., Richardson, TX, USA

Journal: Ultramicroscopy vol.42-44, pt.A p. 388-92

Publication Date: July 1992 **Country of Publication:** Netherlands

CODEN: ULTRD6 **ISSN:** 0304-3991

U.S. Copyright Clearance Center Code: 0304-3991/92/\$05.00

Conference Title: 10 Years of STM. 6th International Conference on Scanning Tunneling Microscopy

Conference Sponsor: Board of Swiss Federal Inst. Technol.; IBM; Swiss Nat. Sci. Found.; Univ. Basel; et al

Conference Date: 12-16 Aug. 1991 **Conference Location:** Interlaken, Switzerland

Language: English **Document Type:** Conference Paper (PA); Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: The authors have demonstrated that a scanning tunneling microscope (STM) tunnel junction acts as a nonlinear signal mixer that can be used to detect dynamic surface motion. The STM probe can be used for measurement of high-frequency **surface displacement** in applications where better lateral resolution is needed than **optical** probes can achieve, e.g., in the characterization of surface-acoustic-wave devices. The STM was operated in constant-average-current mode with constant tip-sample **voltage**. An amplitude-modulated (AM) ultrasonic wave with a carrier frequency of 10 MHz in an X-cut quartz transducer was used to demonstrate the effect and to determine the physics of signal production. The AM frequencies (ω) were higher than the frequency response of the STM feedback circuit but within the passband of the tunneling-current amplifier. The nonlinear **current-displacement** characteristic of the junction acts as a mixer and the detection electronics act as a demodulator in this case. A lock-in amplifier was used to measure the demodulated displacement signals at both ω and 2ω as a function of modulation factor. The results are in good agreement with a model of the STM mixing process. (5 Refs)

Subfile: A

Descriptors: scanning tunnelling microscopy; surface acoustic waves

Identifiers: STM; mixer-demodulator; scanning tunneling microscope; tunnel junction; nonlinear signal mixer; dynamic surface motion; high-frequency **surface displacement**; lateral resolution; surface-acoustic-wave devices; ultrasonic wave; X-cut quartz transducer; tunneling-current amplifier; lock-in amplifier

Class Codes: A6116P (Scanning tunnelling microscopy and related techniques); A6825 (Mechanical and acoustical properties of solid surfaces and interfaces)

8/9/14 (Item 14 from file: 2) [Links](#)

Fulltext available through: [ScienceDirect](#)

INSPEC

04440436 INSPEC Abstract Number: A89096143, B89053671

Title: Calculation of the response of electromagnetic acoustic transducers to broadband acoustic transients

Author Edwards, C.; Palmer, S.B.

Author Affiliation: Warwick Univ., Coventry, UK

Conference Title: IEE Colloquium on 'Mathematical Modelling for NDT' (Digest No.39) p. VIII/1

Publisher: IEE , London, UK

Publication Date: 1989 **Country of Publication:** UK 18 pp.

Conference Sponsor: IEE

Conference Date: 10 March 1989 **Conference Location:** London, UK

Language: English **Document Type:** Conference Paper (PA)

Treatment: Experimental (X)

Abstract: Summary form only given. **Electromagnetic** acoustic transducers (EMATs) operate via a Lorentz force interaction between an acoustic wave and a static magnetic field. This generates eddy **currents** which can be detected by a suitably orientated coil. A Nd:YAG laser with a risetime of 10 ns is used to generate line or point ultrasonic sources with normal drive and approximately Heaviside time dependence. Solutions for these ultrasonic sources give the **surface displacement**. In order to calculate the response of the EMATs to these displacements, the authors convolve with an appropriate time function and differentiate to give velocity. This is easiest on epicentre (on the opposite face vertically below the source) where the waves approximate to plane waves and phase differences across the face of the EMAT can be ignored. The waveform can be calculated by convolving with a Gaussian time function appropriate to the band width of the EMAT/amplifier combination. (5 Refs)

Subfile: A B

Descriptors: acoustic transducers; flaw detection

Identifiers: response; **electromagnetic** acoustic transducers; broadband acoustic transients; Lorentz force interaction; static magnetic field; eddy **currents**; point ultrasonic sources; normal drive; Heaviside time dependence; **surface displacement**; appropriate time function; epicentre; plane waves; phase differences; Gaussian time function; band width; EMAT/amplifier combination

Class Codes: A8170C (Nondestructive testing); A4388 (Transduction; devices for the generation and reproduction of sound); B0590 (Materials testing); B7810C (Sonic and ultrasonic transducers)

8/9/16 (Item 16 from file: 2) [Links](#)

Fulltext available through: [Institution of Electrical Engineers](#) [USPTO Full Text Retrieval Options](#)

INSPEC

02931656 INSPEC Abstract Number: B82051969

Title: Thermodisplacement imaging of current in thin-film circuits

Author Wickramasinghe, H.K.; Martin, Y.; Ball, S.; Ash, E.A.

Author Affiliation: Dept. of Electronic & Electrical Engng., Univ. Coll. London, London, UK

Journal: Electronics Letters vol.18, no.16 p. 700-1

Publication Date: 5 Aug. 1982 **Country of Publication:** UK

CODEN: ELLEAK **ISSN:** 0013-5194

Language: English **Document Type:** Journal Paper (JP)

Treatment: New Developments (N); Practical (P); Experimental (X)

Abstract: The authors present initial results on a novel scheme for measuring **current** distribution in thin-film circuits. When an AC **current** passes through a thin-film circuit, the resulting periodic heating sets up a dynamic **surface displacement** which can be detected using a phase-sensitive laser probe. Results indicate that the present system has a sensitivity of 4×10^{-3} AA for displacement and 2.7×10^{-2} degrees C for temperature in a 1 Hz bandwidth. The spatial resolution can be as small as an **optical** wavelength and is currently limited to 2 μ m by the optics used. As the **surface displacement** amplitude depends on the thermal properties of the substrate material, the technique can also be used to detect defects beneath the metallisation in integrated-circuit structures. (8 Refs)

Subfile: B

Descriptors: **current** distribution; displacement measurement; probes; thin film circuits

Identifiers: **current** distribution measurement; thermodisplacement imaging; thin-film circuits; dynamic **surface displacement**; phase-sensitive laser probe; spatial resolution; integrated-circuit structures

Class Codes: B2220E (Thin film circuits); B7320C (Spatial variables)

8/9/17 (Item 17 from file: 2) [Links](#)

Fulltext available through: [USPTO Full Text Retrieval Options](#)

INSPEC

02767431 INSPEC Abstract Number: A81102659

Title: Optical microdisplacement measurement and vibration analysis

Author Constans, A.; Daury, G.; Dupoisot, H.

Author Affiliation: Lab. Technol. de la Phys. des Surfaces, Conservatoire Nat. des Arts et Metiers, Paris, France

Journal: Optics and Lasers in Engineering vol.1, no.1 p. 69-76

Publication Date: July-Sept. 1980 **Country of Publication:** UK

CODEN: OLENDN **ISSN:** 0143-8166

Language: English **Document Type:** Journal Paper (JP)

Treatment: Practical (P)

Abstract: An **optical** apparatus for microdisplacement measurements has been developed. It is characterised by a very small observation area of several square micrometres. It offers 1000 measurement points and its resolution, depending on the power of the frontal objective, ranges from 2 nm to 100 nm. The same apparatus can be used for measurement of the amplitude and phase of the vibration of a mechanical part. The frequency domain extends from 20 to 100000 Hz. The principle of measurement is as follows. A displacement of the surface examined entails a defocusing which is expressed by the modification of the **light** flow received by a differential photodiode. If the surface vibrates, the **light** flow is modulated and the vibration is translated by a modulation of the photoelectric **currents**. (0 Refs)

Subfile: A

Descriptors: displacement measurement; **optical** instruments; vibration measurement

Identifiers: **light** flow modification; photoelectric **current** modulation; **surface displacement**; vibration analysis; **optical** apparatus; microdisplacement measurements; resolution; frontal objective; defocusing; differential photodiode

Class Codes: A0630C (Spatial variables measurement); A0760 (Optical instruments and techniques); A4630R (Measurement methods and techniques)

8/9/28 (Item 4 from file: 8) [Links](#)

Fulltext available through: [ScienceDirect](#)

Ei Compendex(R)

07761582 E.I. No: EIP97073743290

Title: Detection of photothermal surface displacements measurements with adaptive photodetectors

Author: Rodriguez, P.; Stepanov, S.

Corporate Source: Inst Nacional de Astrofisica, Puebla, Mex

Conference Title: Proceedings of the 1997 Conference on Lasers and Electro-Optics, CLEO

Conference Location: Baltimore, MD, USA **Conference Date:** 19970518-19970523

Sponsor: IEEE

E.I. Conference No.: 46669

Source: Conference Proceedings - Lasers and Electro-Optics Society Annual Meeting-CLEO v 11 1997. IEEE, Piscataway, NJ, USA, 97CH36110. p 45

Publication Year: 1997

CODEN: CPLSE4

Language: English

Document Type: CA; (Conference Article) **Treatment:** X; (Experimental)

Journal Announcement: 9709W2

Abstract: Photodetectors based on the non-steady-state photoelectromotive force offer a simple and efficient way to perform high sensitivity adaptive detection of phase-modulated optical signals. Photothermal **surface displacements** of a reflective sample were measured using an adaptive photodetector fabricated from semi-insulating GaAs. **Surface displacements** produced by the periodic heating of the sample causes oscillations in the fringe pattern on the adaptive photodetector, which in turn induces alternating **currents** through the sample proportion, and thus, are suitable for photothermal **surface displacements** measurement applications. 3 Refs.

Descriptors: *Photodetectors; Surface measurement; Interferometry; Photoelectricity; Helium neon lasers; Phase modulation; **Light** reflection; Semiconducting gallium arsenide; Spectrum analyzers; Frequency response

Identifiers: Photothermal **surface displacement** measurement; Adaptive photodetectors

Classification Codes:

714.1 (Electron Tubes); 714.2 (Semiconductor Devices & Integrated Circuits); 741.3 (Optical Devices & Systems); 943.2 (Mechanical Variables Measurements); 941.4 (Optical Variables Measurements); 741.1 (Light/Optics)

714 (Electronic Components); 741 (Optics & Optical Devices); 943 (Mechanical & Miscellaneous Measuring Instruments); 941 (Acoustical & Optical Measuring Instruments) 71 (ELECTRONICS & COMMUNICATIONS); 74 (OPTICAL TECHNOLOGY); 94 (INSTRUMENTS & MEASUREMENT)

8/9/36 (Item 3 from file: 34) [Links](#)

Fulltext available through: [USPTO Full Text Retrieval Options](#)

SciSearch(R) Cited Ref Sci

02119475 **Genuine Article#:** KC766 **Number of References:** 19

**A NONINVASIVE METHOD FOR THE MEASUREMENT OF FLOW-INDUCED
SURFACE DISPLACEMENT OF A COMPLIANT SURFACE**

Author: HESS DE; PEATTIE RA; SCHWARZ WH

Corporate Source: NATL INST STAND & TECHNOL,BLDG 230,ROOM

105/GAITHERSBURG//MD/20899; JOHNS HOPKINS UNIV/BALTIMORE//MD/21218

Journal: EXPERIMENTS IN FLUIDS , 1993 , V 14 , N1-2 , P 78-84

ISSN: 0723-4864

Language: ENGLISH **Document Type:** ARTICLE

Geographic Location: USA

Subfile: SciSearch; CC ENGI--Current Contents, Engineering, Technology & Applied
Sciences

Journal Subject Category: MECHANICS; INSTRUMENTS & INSTRUMENTATION;
ENGINEERING, MECHANICAL

Abstract: A noninvasive optical method is described which allows the measurement of the vertical component of the instantaneous displacement of a surface at one or more points. The method has been used to study the motion of a passive compliant layer responding to the random forcing of a fully developed turbulent boundary layer. However, in principle, the measurement technique described here can be used equally well with any surface capable of scattering light and to which optical access can be gained. The technique relies on the use of electro-optic position-sensitive detectors; this type of transducer produces changes in current which are linearly proportional to the displacement of a spot of light imaged onto the active area of the detector. The system can resolve displacements as small as 2 μm for a point 1.8 mm in diameter; the final output signal of the system is found to be linear for displacements up to 200 μm , and the overall frequency response is from DC to greater than 1 kHz. As an example of the use of the system, results detailing measurements obtained at both one and two points simultaneously are presented.

Identifiers-- KeyWords Plus: TURBULENT BOUNDARY-LAYER; COATINGS;
WAVES; WALL

Cited References:

ADAIR D, 1991, V62, P1652, REV SCI INSTRUM

BENJAMIN TB, 1963, V16, P436, J FLUID MECH

BUSHNELL DM, 1977, V20, S31, PHYS FLUIDS

CERWIN SA, 1984, P1, S FLOW INDUCED VIBRA

CHU CC, 1984, 9TH S TURB ROLL

DUNCAN JH, 1985, V158, P177, J FLUID MECH

DUNCAN JH, 1986, V171, P339, J FLUID MECH

GADELHAK M, 1986, V39, P511, APPL MECH REV

GADELHAK M, 1986, V53, P206, J APPL MECH-T ASME

GADELHAK M, 1984, V140, P257, J FLUID MECH

HANSEN RJ, 1983, V133, P161, J FLUID MECH

HANSEN RJ, 1980, V68, P317, J SOUND VIB

HESS DE, 1990, THESIS J HOPKINS U B